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# TRANSLATION

SCIENCE BREAKS INTO SPACE

By

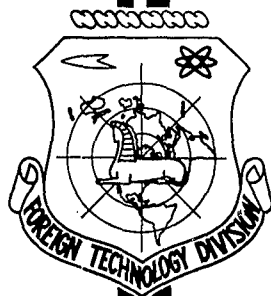
N. Bernsteins

## FOREIGN TECHNOLOGY DIVISION

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## UNEDITED ROUGH DRAFT TRANSLATION

SCIENCE BREAKS INTO SPACE

BY: N. Bernshteyn

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## SCIENCE BREAKS INTO SPACE

The way to space has been unveiled. Mankind has entered the era of cosmic travel. This has been announced to the entire world by first astronauts Yuriy Gagarin, Herman Titov, Adriyan Nikolayev and Pavel Popovich.

The actual agenda contains items relating to remote space flights. At present, scientists in all fields are working on the problem of making it possible to man to stay for a longer time in conditions of cosmic flight. Significant successes have already been obtained in the process of preparing and effecting Soviet spacecraft flights.

Questions relating to air conditioning (thermal control) of the cabin, including the maintenance of the optima levels of air consistency and pressure, temperature and humidity, have been solved satisfactorily.

Astronomers, for their part, have proposed appropriate measures to counter the danger from the corpuscular radiation of the sun at the planned moment of the start. Sufficient information on the extension of the radiation belt around the earth, already obtains by the aid of rockets and artificial satellites, has rendered it possible to draw precise maps of these "cosmic reefs", and, speaking figuratively, to steer the spacecraft at a safe distance from them.

### MICRO-WORLD IN THE SPACECRAFT

In connection with the forthcoming interplanetary travel there arises a question, namely, whether it is possible to detach man from the indivisible rotation of matter and energy, formed on the earth during the process of millions of centuries? Is it possible to take

on the flight a tiny part of our own mother-earth? Certainly, a very insignificant part of it, as compared to the earth itself, but

combined in a way to make it possible to reproduce all that is needed in the micro-world of the spacecraft.

Can this question be solved?

Yes, it can be solved. Scientists already now are performing a thorough research work in this direction.

Certainly, in order to produce a pattern of rotating matter in this micro-world, there is no need to wait until large-size spacecraft will be built where plant growing will be feasible.

Of the articles which had been taken into our animal-carrying spacecraft-satellites, green chlorella algae were mentioned repeatedly. This microscopic plant is rich in chlorophyl - principal regenerator - which effects conversion of carbon dioxide into oxygen and organic carbon.

Chlorella itself and other similar plants, found in nature or developed by selectors, are in measure to secure in the micro-world of the spacecraft mutual assimilation of oxygen and carbon, as on the earth it takes place between animals and vegetable kingdoms.

Plant albumen, fats and carbohydrates, produced by the organisms of these nonpretentious tiny plants, can be also used as nourishment.

Various micro-organisms were tested on the spacecraft-satellites, including those useful to man. The ones which together with the leguminous plants participate in the production of organic nitrogen - as basis for albumen - will also be listed as passengers on the remote space flights.

Thus, the spacecraft can, in fact, become independent from the earth for a limitlessly-long time.

## ELECTRONIC MACHINES AS ASTRONAUT HELPERS

Of no lesser importance is also solution of the second problem, namely repartition of tasks between the pilot and the automaton, in order to make their common effort useful and purposeful.

Capacities of contemporary electronic machines in many ways are certainly greater than those of man. Such a machine can rapidly and precisely execute an assignment, planned and included in its program. It is even capable to work out for itself, independently, a new program, but only in the direction and within the limits as set up by the designer. Man, on the contrary, is not bound by any limitations as to the evaluation of situation, adoption of decisions, and last, as to the forecasting of forthcoming events.

In one word, man is capable to think. But no machine, even the most perfect, is capable to do so. This should be the basic consideration in making the repartition of tasks between the pilot-astronaut and his automaton.

The following tasks will be assigned to the machine: orientation of the cabin, automatic piloting, control and supervision of all numerous thermal climatological problems, feeding the sun batteries, etc.

### MACHINE "TALKS" TO THE PILOT

The machine has to collect and register all the data pertaining to the flight program, and, thereafter, to transmit these data to the earth and also to the astronaut.

It is not necessary at all that the machine would signal detailed information and data on the status of the innumerable indicators on the control panel to man. This part of the work will be managed successfully by the automaton itself. But the other part of information

has to be first selected, grouped and then made known to the astronaut by the automaton.

Theoreticians and ~~practitioners~~ in cybernetics at present are working in this direction, striving to get to the point where the machine would "talk" to the astronaut as comprehensively as possible, in laconic terms and at the right time.

Last, it is necessary that the automatics on the spacecraft would contain one more group of devices which could be called "retransmission" devices.

To make it clear, it might be said that the guidance of all our movements, by means of our muscles, is based on the retransmission mechanism of commands. While jumping, running or making other movements, ~~no one~~ of us is conscious of the numerous muscles of our body acting and in what sequence they are acting. The higher sections of the brain issue a short purposeful order, but other sections retransmit this order in tens and hundreds of commands, given to particular muscles. Retransmission devices should be designed and developed for the benefit of astronauts, similarly to such a physiological apparatus.

Heroism and mastership of Soviet astronauts plus the rapid development of modern technology in Soviet Union, will, doubtlessly, retain also in future for our country the priority in the research and mastering of the cosmic space for the benefit of all mankind.



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